IN THE CLAIMS:

Amend the claims as indicated below.

1   1. (currently amended) A method for a spread spectrum detector, comprising the steps
2   of:
3   receiving a spread spectrum modulated signal having a Doppler shift error imposed by
4   movement between a signal source and a receiver;
5   producing a plurality of complex first correlation values based upon the signal and a
6   code;
7   generating a plurality of complex second correlation values respectively from the first
8   correlation values using a fast fourier transform, wherein generating includes combining a stored,
9   associated, phase shift value with each of the first correlation values to produce the second
10   correlation valuesthe second correlation values being phase shifted by respective different
11   amounts from corresponding first correlation values, so that the second correlation values exhibit
12   less of the Doppler shift error than the first correlation values; and
13   combining the second correlation values to derive a complex third correlation value that
14   indicates a degree of correspondence of the code with the signal.

1   2. (original) The method of claim 1, further comprising the steps of:
2   performing the producing, generating, and integrating steps a plurality of times with a
3   different code phase of the code each time in order to produce a plurality of third correlation
4   values; and
5   determining that a particular one of the code phases corresponds to the signal based upon
6   the third correlation values.

1   3. (original) The method of claim 1, wherein the producing step comprises the steps of:
2   multiplying chips of the code with signal samples, respectively, to derive multiplication
3   results; and
4   adding together the multiplication results to produce the first correlation values.

1   4. (original) The method of claim 1, further comprising the steps of:
2   storing the first correlation values in a memory; and

3   communicating the first correlation values from the memory to combinational logic that

4   implements the fast fourier transform.

1   5. (original) The method of claim 1, further comprising the steps of:

2   performing the producing step a plurality of times with a different code phase of the code

3   each time in order to produce more then one plurality of first correlation values, one

4   corresponding with each of the different code phases;

5   storing each plurality of first correlation values in a memory; and

6   performing the generating step upon each plurality of first correlation values, one at a

7   time, so as to create a plurality of second correlation values for each code phase.

1   6. (original) The method of claim 1, wherein the second correlation values are

2   combined noncoherently in the combining step so that the third correlation value comprises a real

3   number part and an imaginary number part, which are collectively indicative of a magnitude and

4   a phase.

1   7. (original) The method of claim 1, wherein the second correlation values are

2   combined noncoherently in the combining step so that the third correlation value comprises a

3   magnitude.

1   8. (original) The method of claim 1, wherein the producing step comprises the step of

2   using a matched filter to produce the first correlation values.

1   9. (original) The method of claim 1, wherein the producing step comprises the step of

2   using a digital signal processor to produce the first correlation values.

1   10. (original) The method of claim 1, wherein the signal is received from a satellite

2   associated with a global positioning system.

1   11. (original) The method of claim 1, wherein the signal is a carrier signal modulated

2   with a repeating code.

1   12. (original) The method of claim 2, wherein the determining step is performed by a

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2 processor.

1 13. (currently amended) (currently amended) A spread spectrum detector, comprising:

2 first means for receiving a spread spectrum modulated signal having a Doppler shift error

3 imposed by movement between a signal source and a receiver;

4 second means for producing a plurality of complex first correlation values based upon the

5 signal and a code;

6 third means for generating a plurality of complex second correlation values respectively

7 from the first correlation values by implementing a fast fourier transform, wherein generating

8 includes combining a stored, associated, phase shift value with each of the first correlation values

9 to produce the second correlation values~~the second correlation values being phase shifted by~~

10 ~~respective different amounts from corresponding first correlation values, so that the second~~

11 ~~correlation values exhibit less of the Doppler shift error than the first correlation values~~; and

12 fourth means for combining the second correlation values to derive a third correlation

13 value that indicates a degree of correspondence of the code with the signal.

1 14. (original) The detector of claim 13, further comprising:

2 fifth means for determining that a code phase of the code corresponds to the signal based

3 upon the third correlation value.

1 15. (original) The detector of claim 13, wherein the second means comprise:

2 means for multiplying chips of the code with signal samples, respectively, to derive

3 multiplication results; and

4 means for adding together the multiplication results to produce the first correlation

5 values.

1 16. (original) The detector of claim 13, further comprising:

2 means for producing first correlation values with a different code phase of the code each

3 time in order to produce more than one plurality of first correlation values, one corresponding

4 with each of the different code phases;

5 means for storing each plurality of the first correlation values in a memory; and

6   means for generating a plurality of second correlation values for each plurality of first

7   correlation values, each plurality of second correlation values corresponding to a respective code

8   phase.

1   17. (original) The detector of claim 13, wherein the fourth means comprises a means for

2   coherently combining the second correlation values together so that the third correlation value

3   comprises a real number part and an imaginary number part, which are collectively indicative of

4   a magnitude and a phase.

1   18. (original) The detector of claim 13, wherein the third means comprises a means for

2   noncoherently combining the second correlation values together so that the third correlation

3   value comprises a magnitude and no phase information.

1   19. (original) The detector of claim 13, wherein the second means comprises a matched

2   filter means for producing the first correlation values.

1   20. (original) The detector of claim 13, wherein the second means comprises a digital

2   signal processing means for producing the first correlation values.

1   21. (original) The detector of claim 13, wherein the signal is received from a satellite

2   associated with a global positioning system.

1   22. (original) The detector of claim 13, wherein the signal is a carrier signal modulated

2   with a repeating code.

1   23. (original) The detector of claim 13, wherein the third means comprises:

2   means for storing the first correlation values in a memory; and

3   means for communicating the first correlation values from the memory to combinational

4   logic that implements the fast fourier transform.

1   24. (currently amended) A spread spectrum detector, comprising:

2   a receiver configured to receive a spread spectrum modulated signal having a Doppler

3   shift error imposed by movement between a signal source and a receiver;

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PAGE 13/33 * RCVD AT 12/1/2003 3:49:57 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:408 236 6641 * DURATION (mm-ss):11-14

4   a multiplier configured to produce a plurality of complex first correlation values based

5   upon the signal and a code;

6   a fast fourier phase shifter configured to generate a plurality of complex second

7   correlation values respectively from the first correlation values using a fast fourier transform,

8   wherein generating includes combining a stored, associated, phase shift value with each of the

9   first correlation values to produce the second correlation values~~the second correlation values~~

10   ~~being phase-shifted by respective different amounts from corresponding first correlation values,~~

11   ~~so that the second correlation values exhibit less of the Doppler shift error than the first~~

12   ~~correlation values~~; and

13   an integrator configured to integrate the second correlation values to derive a third

14   correlation value that indicates a degree of correspondence of the code with the signal.

1   25. (original) The spread spectrum detector of claim 24, further comprising:

2   a processor programmed to determine that a particular one of code phases of the code

3   corresponds to the signal based upon the third correlation value.

1   26. (original) The detector of claim 24, wherein the multiplier comprises:

2   a plurality of multipliers configured to multiply chips of each code phase with signal

3   samples, respectively, to derive the multiplication results; and

4   a plurality of adders configured to add together the multiplication results to produce the

5   first correlation values.

1   27. (original) The detector of claim 24, wherein the multiplier is configured to produce

2   first correlation values with a different code phase of the code each time in order to produce more

3   than one plurality of first correlation values, one corresponding with each of the different code

4   phases; and wherein the multiplier is adapted to store each plurality of the first correlation values

5   in a memory; and further comprising means for generating a plurality of second correlation

6   values for each plurality of first correlation values, each plurality of second correlation values

7   corresponding to a respective code phase.

1   28. (original) The detector of claim 24, wherein the integrator is configured to coherently

2   combine the second correlation values together so that the third correlation value comprises a

3   real number part and an imaginary number part, which are collectively indicative of a magnitude

4   and a phase.

1   29. (original) The detector of claim 24, wherein the integrator is configured to

2   noncoherently combine the second correlation values together so that the third correlation value

3   comprises a magnitude and no phase information.

1   30. (original) The detector of claim 24, wherein the multiplier comprises a matched filter

2   configured to produce the first correlation values.

1   31. (original) The detector of claim 24, wherein the multiplier comprises a digital signal

2   processor to produce the first correlation values.

1   32. (original) The detector of claim 24 wherein the signal is received from a satellite

2   associated with a global positioning system.

1   33. (original) The detector of claim 24, wherein the signal is a carrier signal modulated

2   with a repeating code.

1   34. (currently amended) A computer readable medium having a program, the program

2   comprising:

3   first logic to receive a spread spectrum modulated signal having a Doppler shift error

4   imposed by movement between a signal source and a receiver;

5   second logic to produce a plurality of complex first correlation values based upon the

6   signal and a code;

7   third logic to generate a plurality of complex second correlation values respectively from

8   the first correlation values by implementing a fast fourier transform, <u>wherein generating includes</u>

9   <u>combining a stored, associated, phase shift value with each of the first correlation values to</u>

10 <u>produce the second correlation values</u>the second correlation values being phase shifted by

11 respective different amounts from corresponding first correlation values, so that the second

12 correlation values exhibit less of the Doppler shift error than the first correlation values; and

13   fourth logic to combine the second correlation values to derive a third correlation value

14   that indicates a degree of correspondence of the code with the signal.

1   35. (original) The computer readable medium of claim 34, further comprising:

2   fifth logic to determine that a code phase of the code corresponds to the signal based upon

3   the third correlation value.

1   36. (original) The computer readable medium of claim 34, wherein the second logic

2   comprises:

3   logic to multiply chips of the code with signal samples, respectively, to derive the

4   multiplication results; and

5   logic to add together the multiplication results to produce the first correlation values.

1   37. (original) The computer readable medium of claim 34, wherein the third logic

2   comprises:

3   logic to produce first correlation values with a different code phase of the code each time

4   in order to produce more than one plurality of first correlation values, one corresponding with

5   each of the different code phases;

6   logic to store each plurality of the first correlation values in a memory; and

7   logic to generate a plurality of second correlation values for each plurality of first

8   correlation values, each plurality of second correlation values corresponding to a respective code

9   phase.

1   38. (original) The computer readable medium of claim 34, wherein the fourth logic

2   comprises logic to coherently combine the second correlation values together so that the third

3   correlation value comprises a real number part and an imaginary number part, which are

4   collectively indicative of a magnitude and a phase.

1   39. (original) The computer readable medium of claim 34, wherein the fourth logic

2   comprises logic to noncoherently combine the second correlation values together so that the third

3   correlation value comprises a magnitude and no phase information.

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1   40. (original) The computer readable medium of claim 34 wherein the signal is received

2 from a satellite associated with a global positioning system.

1   41. (original) The computer readable medium of claim 34, wherein the signal is a carrier

2 signal modulated with a repeating code.

1   42. (currently amended) A GPS receiver, comprising:

2   a first GPS antenna coupled to a digital memory, the digital memory storing first digitized

3 signals obtained through the first GPS antenna;

4   a second GPS antenna coupled to the digital memory, the digital memory storing second

5 digitized signals obtained through the second GPS antenna;

6   a digital processor coupled to the digital memory, the digital processor processing the first

7 digitized signals after being stored in the digital memory to provide the first position information

8 and processing the second digitized signals after being stored in the digital memory to provide

9 second position information;

10   a receiver configured to receive a spread spectrum modulated signal having a Doppler

11 shift error imposed by movement between a signal source and a receiver;

12   a multiplier configured to produce a plurality of complex first correlation values based

13 upon the signal and a code;

14   a phase shifter configured to generate a plurality of complex second correlation values

15 respectively from the first correlation values using a fast fourier transform (FFT), <u>wherein</u>

16 <u>generating includes combining a stored, associated, phase shift value with each of the first</u>

17 <u>correlation values to produce the second correlation values</u>the second correlation values being

18 phase shifted by respective different amounts from corresponding first correlation values, so that

19 the second correlation values exhibit less of the Doppler shift error than the first correlation

20 values; and

21   an integrator configured to integrate the second correlation values to derive a third

22 correlation value that <u>indicates</u>indicate a degree of correspondence of the code with the signal.

1   43. (currently amended) A method of operating a GPS receiver, the method comprising:

2   receiving first GPS signals through a first GPS antenna;

3   digitizing the first GPS signals to provide first digitized signals and storing the first

4   digitized signals in a first digital memory;

5   receiving second GPS signals through a second GPS antenna;

6   digitizing the second GPS signals to provide second digitized signals and storing the

7   second digitized signals in one of the first digital memory and a second digital memory;

8   processing in a digital processor the stored first digitized signals to provide a first position

9   information and processing the stored second digitized signals to provide a second position

10   information;

11   selecting one of the first position information and the second position information to

12   provide a selected position information; and

13   when performing the processing step, performing the following steps upon each of the

14   first and second GPS signals;

15   producing a plurality of complex first correlation values based upon the signal and a

16   code;

17   generating a plurality of complex second correlation values respectively from the first

18   correlation values using a fast fourier transform (FFT), wherein generating includes

19   combining a stored, associated, phase shift value with each of the first correlation values

20   to produce the second correlation values~~the second correlation values being phase shifted~~

21   ~~by respective different amounts from corresponding first correlation values, so that the~~

22   ~~second correlation values exhibit less of the Doppler shift error than the first correlation~~

23   ~~values~~; and

24   combining the second correlation values to derive a complex third correlation value

25   that indicates a degree of correspondence of the code with the signal.

1   44. (currently amended) A method for determining a position of a mobile global

2   positioning system receiver, the mobile global positioning receiver receiving global positioning

3   system signals from at least one of a plurality of global positioning system (GPS) satellites, the

4   method comprising:

5   receiving a cellular communication signal in a mobile communication receiver coupled to

6   the mobile global positioning system receiver, the cellular communication signal having a time

7   indicator which represents a time event;

8   associating the time indicator with data representing a time of arrival of a GPS satellite

9   signal at the mobile global positioning system receiver;

10   determining position information of the mobile global positioning system receiver,

11   wherein the data representing the time of arrival of the GPS satellite signal and the time indicator

12   are used to determine the position information of the mobile global positioning system receiver

13   and wherein the cellular communication signal supports 2-way communications; and

14   when performing the determining step, performing the following steps:

15   producing a plurality of complex first correlation values based upon a signal and a

16   code;

17   generating a plurality of complex second correlation values respectively from the first

18   correlation values using a fast fourier transform (FFT), wherein generating includes

19   combining a stored, associated, phase shift value with each of the first correlation values

20   to produce the second correlation valuesthe second correlation values being phase shifted

21   by respective different amounts from corresponding first correlation values, so that the

22   second correlation values exhibit less of the Doppler shift error than the first correlation

23   values; and

24   combining the second correlation values to derive a complex third correlation value

25   that indicates a degree of correspondence of the code with the signal.

1   45. (currently amended) A method of operating a global positioning system (GPS)

2   receiver, comprising:

3   sensing whether GPS signals are capable of being received from GPS satellites and

4   providing an activation signal when GPS signals are capable of being received;

5   maintaining the GPS receiver in a low power state;

6   activating the GPS receiver from the low power state upon detecting the activation signal;

7   producing a plurality of complex first correlation values based upon a GPS signal and a

8   code;

9   generating a plurality of complex second correlation values respectively from the first

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10   correlation values using a fast fourier transform (FFT), wherein generating includes combining a

11   stored, associated, phase shift value with each of the first correlation values to produce the

12   second correlation valuesthe second correlation values being phase shifted by respective different

13   amounts from corresponding first correlation values, so that the second correlation values exhibit

14   less of the Doppler shift error than the first correlation values; and

15   combining the second correlation values to derive a complex third correlation value that

16   indicates a degree of correspondence of the code with the signal.

1   46. (currently amended) A method for using a dual mode GPS receiver, the method

2   comprising the steps of:

3   activating the GPS receiver in a first mode of operation including,

4   receiving GPS signals from in view satellites;

5   downconverting and demodulating the GPS signals to extract Doppler information

6   regarding in view satellites and to compute pseudorange information;

7   storing the Doppler information;

8   detecting when the GPS information is experiencing blockage conditions and activating a

9   second mode of operation in response thereto, the second mode including, digitizing the GPS

10   signals at a predetermined rate to produce sampled GPS signals; and

11   receiving a signal having a Doppler shift error imposed by movement between a signal

12   source and the GPS receiver;

13   producing a plurality of complex first correlation values based upon the signal and a

14   code;

15   generating a plurality of complex second correlation values respectively from the first

16   correlation values using a fast fourier transform (FFT), wherein generating includes combining a

17   stored, associated, phase shift value with each of the first correlation values to produce the

18   second correlation valuesthe second correlation values being phase shifted by respective different

19   amounts from corresponding first correlation values, so that the second correlation values exhibit

20   less of the Doppler shift error than the first correlation values; and

21   combining the second correlation values to derive a complex third correlation value that

22   indicates a degree of correspondence of the code with the signal.

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1   47. (currently amended) In a method for determining the position of a remote unit, a

2   process comprising:

3   receiving, at the remote unit from a transmission cell in a cellular communication system,

4   a Doppler information of a satellite in view of the remote unit;

5   computing, in a remote unit, position information for the satellite by using the Doppler

6   information without receiving and without using satellite ephemeris information;

7   when computing the position information, performing the following steps:

8   producing a plurality of complex first correlation values based upon the signal and a

9   code;

10   generating a plurality of complex second correlation values respectively from the first

11   correlation values using a fast fourier transform (FFT), wherein generating includes

12   combining a stored, associated, phase shift value with each of the first correlation values

13   to produce the second correlation values~~the second correlation values being phase shifted~~

14   ~~by respective different amounts from corresponding first correlation values, so that the~~

15   ~~second correlation values exhibit less of the Doppler shift error than the first correlation~~

16   ~~values~~; and

17   combining the second correlation values to derive a complex third correlation value

18   that indicates a degree of correspondence of the code with the signal.

1   48. (currently amended) A method of using a base station for providing a

2   communications link to a mobile GPS unit, the method comprising:

3   determining Doppler information of a satellite in view of the mobile GPS unit, wherein

4   the Doppler information is used by the mobile GPS unit to determine a position information for

5   the satellite;

6   transmitting from a transmission cell in a cellular communication system the Doppler

7   information of the satellite in view to the mobile GPS unit wherein the mobile GPS unit

8   determines the position information without receiving and without using satellite ephemeris

9   information;

10   when performing the determining step, performing the following steps:

11   receiving a signal having a Doppler shift error imposed by movement between a

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12   satellite and a GPS receiver producing a plurality of complex first correlation values

13   based upon the signal and a code;

14   generating a plurality of complex second correlation values respectively from the first

15   correlation values using a fast fourier transform (FFT), wherein generating includes

16   combining a stored, associated, phase shift value with each of the first correlation values

17   to produce the second correlation values~~the second correlation values being phase shifted~~

18   ~~by respective different amounts from corresponding first correlation values, so that the~~

19   ~~second correlation values exhibit less of the Doppler shift error than the first correlation~~

20   ~~values~~; and

21   combining the second correlation values to derive a complex third correlation value

22   that indicates a degree of correspondence of the code with the signal.

1   49. (currently amended) A method of determining the location of a remote object

2   comprising the steps of:

3   transporting a positioning sensor to a remote object;

4   repositioning the positioning sensor to a fix position such that the positioning sensor is

5   capable of receiving positioning signals, the fix position being in a known position relative to the

6   position of the remote sensor;

7   storing a predetermined amount of data in the positioning sensor while the positioning

8   sensor is located at the fix position, the data comprising the positioning signals;

9   processing the data to determine the location of the fix position;

10   computing the location of the remote object using the location of the fix position; and

11   when performing the processing steps, performing the following steps:

12   producing a plurality of complex first correlation values based upon the signal and a

13   code;

14   generating a plurality of complex second correlation values respectively from the first

15   correlation values using a fast fourier transform (FFT), wherein generating includes

16   combining a stored, associated, phase shift value with each of the first correlation values

17   to produce the second correlation values~~the second correlation values being phase shifted~~

18   ~~by respective different amounts from corresponding first correlation values, so that the~~

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19   ~~second correlation values exhibit less of the Doppler shift error than the first correlation~~

20   ~~values~~; and

21   combining the second correlation values to derive a complex third correlation value

22   that indicates a degree of correspondence of the code with the signal.

1   50. (currently amended) A method of tracking a remote object comprising the steps of:

2   fitting a remote object with a positioning sensor configured to receive and store

3   positioning information when the remote object is in a fix position;

4   positioning the remote object in a fix position such that the positioning sensor is capable

5   of detecting an activation signal;

6   processing and storing a predetermined amount of data in the positioning sensor, the data

7   comprising position information;

8   processing the data to determine the location of the fix position;

9   when processing the data, performing the following steps:

10   producing a plurality of complex first correlation values based upon the signal and a

11   code;

12   generating a plurality of complex second correlation values respectively from the first

13   correlation values using a fast fourier transform (FFT), <u>wherein generating includes combining a</u>

14   <u>stored, associated, phase shift value with each of the first correlation values to produce the</u>

15   <u>second correlation values</u>~~the second correlation values being phase shifted by respective different~~

16   ~~amounts from corresponding first correlation values, so that the second correlation values exhibit~~

17   ~~less of the Doppler shift error than the first correlation values~~; and

18   combining the second correlation values to derive a complex third correlation value

19   that indicates a degree of correspondence of the code with the signal.

1   51. (currently amended) A computer readable medium containing a computer program

2   having executable code for a GPS receiver, the computer program comprising:

3   first instructions for receiving GPS signals from in view satellites, the GPS signals

4   comprising pseudorandom (PN) codes;

5   second instructions for digitizing the GPS signals at a predetermined rate to produce

6   sampled GPS signals;

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7   third instructions for storing the sampled GPS signals in a memory; and

8   fourth instructions for processing the sampled GPS signal by performing a plurality of

9 convolutions on the sampled GPS signals, the processing comprising performing the plurality of

10 convolutions on a corresponding plurality of blocks of the sampled GPS signals to provide a

11 plurality of corresponding results of each convolution and summing a plurality of mathematical

12 representations of the plurality of corresponding results to obtain a first position information; and

13   wherein the fourth in instructions are designed to:

14   produce a plurality of complex first correlation values based upon the signal and a

15   code~;

16   generate a plurality of complex second correlation values respectively from the first

17 correlation values using a fast fourier transform (FFT), wherein generating includes

18 combining a stored, associated, phase shift value with each of the first correlation values

19 to produce the second correlation values~the second correlation values being phase shifted

20 by respective different amounts from corresponding first correlation values, so that the

21 second correlation values exhibit less of the Doppler shift error than the first correlation

22 values; and

23   combine the second correlation values to derive a complex third correlation value that

24   indicates a degree of correspondence of the code with the signal.

1   52. (currently amended) A computer readable medium containing an executable

2 computer program for use in a digital processing system, the executable computer program when

3 executed in the digital processing system causing the digital processing system to perform the

4 steps of:

5   performing a plurality of convolutions of a corresponding plurality of blocks of sampled

6 GPS signals to provide a plurality of corresponding results of each convolution;

7   summing a plurality of mathematical representations of the plurality of corresponding

8 results to obtain a first position information; and

9   when performing the plurality of convolutions step, performing at least the following

10   steps:

11   producing a plurality of complex first correlation values based upon the signal and a

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12   code;

13   generating a plurality of complex second correlation values respectively from the first

14   correlation values using a fast fourier transform (FFT), <u>wherein generating includes</u>

15   <u>combining a stored, associated, phase shift value with each of the first correlation values</u>

16   <u>to produce the second correlation values</u>~~the second correlation values being phase-shifted~~

17   ~~by respective different amounts from corresponding first correlation values, so that the~~

18   ~~second correlation values exhibit less of the Doppler shift error than the first correlation~~

19   ~~values~~; and

20   combining the second correlation values to derive a complex third correlation value

21   that indicates a degree of correspondence of the code with the signal.

1   53. (currently amended) A method of calibrating a local oscillator in a mobile GPS

2   receiver, the method comprising:

3   receiving a precision carrier frequency signal from a source providing the precision

4   carrier frequency;

5   automatically locking to the precision carrier frequency signal and providing a reference

6   signal;

7   calibrating the local oscillator with the reference signal, the local oscillator being used to

8   acquire GPS signals;

9   receiving a signal having a Doppler shift error imposed by movement between a signal

10   source and the GPS receiver;

11   producing a plurality of complex first correlation values based upon the signal and a

12   code;

13   generating a plurality of complex second correlation values respectively from the first

14   correlation values using a fast fourier transform (FFT), <u>wherein generating includes combining a</u>

15   <u>stored, associated, phase shift value with each of the first correlation values to produce the</u>

16   <u>second correlation values</u>~~the second correlation values being phase-shifted by respective different~~

17   ~~amounts from corresponding first correlation values, so that the second correlation values exhibit~~

18   ~~less of the Doppler shift error than the first correlation values~~; and

19   combining the second correlation values to derive a complex third correlation value that

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20   indicates a degree of correspondence of the code with the signal.

1   54. (currently amended) A method of using a base station to calibrate a local oscillator in

2   a mobile GPS receiver, the method comprising:

3   producing a first reference signal having a precision frequency;

4   modulating the first reference signal with a data signal to provide a precision carrier

5   frequency signal;

6   transmitting the precision carrier frequency signal to the mobile GPS receiver, the

7   precision carrier frequency signal being used to calibrate a local oscillator in the mobile GPS

8   receiver, the local oscillator being used to acquire GPS signals;

9   receiving a spread spectrum signal having a Doppler shift error imposed by movement

10   between a signal source and the GPS receiver;

11   producing a plurality of complex first correlation values based upon the signal and a

12   code;

13   generating a plurality of complex second correlation values respectively from the first

14   correlation values using a fast fourier transform (FFT), wherein generating includes combining a

15   stored, associated, phase shift value with each of the first correlation values to produce the

16   second correlation valuesthe second correlation values being phase shifted by respective different

17   amounts from corresponding first correlation values, so that the second correlation values exhibit

18   less of the Doppler shift error than the first correlation values; and

19   combining the second correlation values to derive a complex third correlation value that

20   indicates a degree of correspondence of the code with the signal.

1   55. (currently amended) A method of deriving a local oscillator signal in a mobile GPS

2   receiver, the method comprising:

3   receiving a precision carrier frequency signal from a source providing the precision

4   carrier frequency signal;

5   automatically locking to the precision carrier frequency signal and providing a reference

6   signal;

7   using the reference signal to provide a local oscillator signal to acquire GPS signals;

8   receiving a spread spectrum signal having a Doppler shift error imposed by movement

9   between a signal source and the GPS receiver;

10   producing a plurality of complex first correlation values based upon the signal and a

11   code;

12   generating a plurality of complex second correlation values respectively from the first

13   correlation values using a fast fourier transform (FFT), wherein generating includes combining a

14   stored, associated, phase shift value with each of the first correlation values to produce the

15   second correlation valuesthe second correlation values being phase shifted by respective different

16   amounts from corresponding first correlation values, so that the second correlation values exhibit

17   less of the Doppler shift error than the first correlation values; and

18   combining the second correlation values to derive a complex third correlation value that

19   indicates a degree of correspondence of the code with the signal.

1   56. (currently amended) A method of processing position information, the method

2   comprising:

3   receiving SPS signals from at least one SPS satellite;

4   transmitting cell based communication signals between a communication system coupled

5   to the SPS receiver and a first cell based transceiver which is remotely positioned relative to the

6   SPS receiver wherein the cell based communication signals are wireless;

7   determining a first time measurement which represents a time of travel of a message in

8   the cell based communication signals in a cell based communication system which comprises a

9   first cell based transceiver and the communications system;

10   determining a second time measurement which represents a time of travel of the SPS

11   signals;

12   determining a position of the SPS receiver from at least one of the first time measurement

13   and the second time measurement, wherein the cell based communication signals are capable of

14   communicating data messages in a two-way direction between the first cell based transceiver and

15   the communication system; and

16   performing the following steps during at least one of the determining steps:

17   producing a plurality of complex first correlation values based upon the signal and a

18   code;

19   generating a plurality of complex second correlation values respectively from the first

20   correlation values using a fast fourier transform (FFT), <u>wherein generating includes</u>

21   <u>combining a stored, associated, phase shift value with each of the first correlation values</u>

22   <u>to produce the second correlation values</u>the second correlation values being phase shifted

23   by respective different amounts from corresponding first correlation values, so that the

24   second correlation values exhibit less of the Doppler shift error than the first correlation

25   values; and

26   combining the second correlation values to derive a complex third correlation value

27   that indicates a degree of correspondence of the code with the signal.

1   57. (currently amended) A method of processing position information in a digital

2   processing system, the method comprising:

3   determining a first time measurement which represents a time of travel of a message in

4   cell based communication signals in a cell based communication system which comprises a first

5   cell based transceiver which communicates with the digital processing system and a

6   communication system which communicates in a wireless manner with the first cell based

7   transceiver;

8   determining a position of a SPS receiver from at least the first time measurement and a

9   second time measurement which represents a time of travel of SPS signals received at the SPS

10   receiver which is integrated with the communication system and is remotely located relative to

11   the first cell based transceiver and the digital processing system, wherein the cell based

12   communication signals are capable of communicating messages from the communication system

13   to the first cell based transceiver; and

14   performing the following steps when determining the position:

15   receiving a signal having a Doppler shift error imposed by movement between a

16   signal source and the GPS receiver;

17   producing a plurality of complex first correlation values based upon an SPS signal

18   and a code;

19   generating a plurality of complex second correlation values respectively from the first

20   correlation values using a fast fourier transform (FFT), <u>wherein generating includes</u>

21   combining a stored, associated, phase shift value with each of the first correlation values

22   to produce the second correlation valuesthe second correlation values being phase shifted

23   by respective different amounts from corresponding first correlation values, so that the

24   second correlation values exhibit less of the Doppler shift error than the first correlation

25   values; and

26   combining the second correlation values to derive a complex third correlation value

27   that indicates a degree of correspondence of the code with the signal.

1   58. (currently amended) A method of controlling a communication link and processing

2 data representative of GPS signals from at least one satellite in a GPS receiver, the method

3 comprising:

4   processing the data representative of GPS signals from at least one satellite in a

5 processing unit, including performing a correlation function to determine a pseudorange based on

6 the data representative of GPS signals;

7   controlling communication signals through the communication link by using the

8 processing unit to perform the controlling and wherein the processing unit performs

9 demodulation of communication signals sent to the GPS receiver; and

10   when performing the processing step, performing at least the following steps:

11   receiving a signal having a Doppler shift error imposed by movement between a

12   signal source and the GPS receiver;

13   producing a plurality of complex first correlation values based upon the signal and a

14   code;

15   generating a plurality of complex second correlation values respectively from the first

16   correlation values using a fast fourier transform (FFT), wherein generating includes

17   combining a stored, associated, phase shift value with each of the first correlation values

18   to produce the second correlation valuesthe second correlation values being phase shifted

19   by respective different amounts from corresponding first correlation values, so that the

20   second correlation values exhibit less of the Doppler shift error than the first correlation

21   values; and

22   combining the second correlation values to derive a complex third correlation value

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23   that indicates a degree of correspondence of the code with the signal.